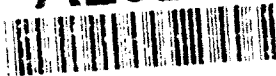


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Cultural Resources Intensive Survey,
With Testing, of the
Millington Naval Base Levee Construction Site,
Millington, Shelby County, Tennessee

by

Gerald P. Smith
Principal Investigator

1990

Prepared for
Department of the Army
Memphis District
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Cultural Resources Intensive Survey, With
Testing, of the Millington Naval Base
Levee Construction Site, Millington,
Shelby County, Tennessee

Gerald P. Smith

ABSTRACT

Project field work has been completed with negative results for cultural resources eligible for the National Register of Historic Places. Most of the levee construction area has been disturbed in recent years by modern residential and industrial construction. Shovel testing was conducted in the few open areas remaining and encountered only plow zone and subsoil without artifacts.

In the borrow pit area a site designated 40SY514 was found to extend into the impact area. The site is a thin lithic scatter centered south of the impact area but whose northern margin extends into the area. A one-meter test unit was excavated on the site within the impact area and encountered only plow zone and subsoil, without any artifacts. No further archaeological investigation appears necessary for this project. The project boundaries have been revised to avoid the site and leave a buffer zone around it.

ENVIRONMENTAL SETTING AND RESOURCE POTENTIAL

Big Creek is a medium-sized stream in southwestern Tennessee which drains into the Loosahatchie River from the loess uplands. It was a meandering stream with a broad floodplain until channelization during this century. Recent vegetation consisted of gum-cypress swamp forest in the floodplain and oak-hickory in the upland portion of the drainage.

At the height of the last half of the Wisconsin glaciation, about 21,000 to 15,000 B.C., the Ohio River occupied the present Mississippi River valley east of Crowley's Ridge and was down-cutting previous valley fill in response to the lowered sea levels of the time. Recent studies in the mid-continent region suggest that temperatures during this period averaged about 12°C (22°F) below present (Brister et al. 1981:30), but remained above -40°C (-40°F) (Delcourt et al. 1980:13). Vegetation consisted of spruce-northern pine forest on the uplands, with beech, red maple, black walnut, sweet gum, and other hardwoods surviving in sheltered areas.

By about 15,000 B.C. a gradual warming trend began the final retreat of the Wisconsin ice sheet and the refilling of the Mississippi River valley with glacial outwash. It was also at this time that the Mississippi River cut through Crowley's Ridge at the Bell City-Oran (Missouri) Gap and joined with the Ohio River in forming a complex braided-stream

pattern between Crowley's Ridge and the eastern bluff line. Filling of the valley ultimately reached a higher elevation than the present surface of most of the valley floor north of Memphis; this earlier surface survives in remnant form in such features as Malden Plain in southeastern Missouri and remnant braided stream terraces in western Dyer and Lauderdale Counties in Tennessee. Renewed loess deposition in the uplands accompanied development of the extensive braided-stream formation with its large areas of bare soil. Valley filling continued until about 9000 B.C. when glacial retreat reopened the St. Lawrence River valley as the primary outlet for glacial meltwaters.

Climatic warming was also accompanied by resurgence of such deciduous forest species as oak, ash, hickory, beech, maple, walnut, and birch. Replacement of the northern coniferous forest may have been virtually complete by as early as 10,500 B.C. This forest transition would have greatly increased the carrying capacity of the area for all modern game species, but removed the boreal forest habitat apparently favored by the mastodon. Continued warming to conditions somewhat cooler than present during the period between 10,000 to 5,000 B.C. led to a mesic deciduous forest, including a few conifers, beech, birch, elm, ash, maple, oak, hickory, walnut, and chestnut. Warming and drying of the climate peaked between 5,000 and 3,000 B.C. with conditions somewhat warmer and dryer than at present. During this period the species requiring cool,

moist conditions were sharply reduced and the modern oak-hickory dominance was established in the upland portion of the drainage. Major habitat zones included floodplain, terrace, and upland areas.

Four relevant apparent terrace surfaces are definable in the Loosahatchie drainage, at 3 to 5 ft above the modern floodplain, with others at 10 to 23 ft, 22 to 40 ft, and 55 to 60 ft. This is a pattern shared by other terraces adjacent to west Tennessee streams tributary to the Mississippi River, and is thought to date from a time during, or beginning just before, the Wisconsin glaciation (Smith 1980; Saucier n.d.). They would correspond to subdivisions of Saucier's Finley Terrace and Smith's T-2a or T-1 (lower) terraces, and to Saucier's Hatchie Terrace and Smith's T-2b (upper) Terrace in adjacent drainages. The controlling factor in their formation is viewed as the level of glacial outwash and its subsequent downcutting. Saucier attributes the Finley Terrace to Early Wisconsin events prior to 30,000 B.C. and the Hatchie Terrace to the Sangamon Interglacial, between 120,000 and 80,000 B.C. Due primarily to a lack of dissection of the loess and loess/silt terraces, it may be reasonable to consider the Finley/T-2b or T-1 terrace as dating to between 15,000 and 10,000 B.C., during the period of glacial outwash build-up in the Mississippi Valley, and the Hatchie/T-2 surface as corresponding to the outwash build-up which occurred at the end of the Early Wisconsin glaciation prior to 30,000 B.C.

The ecological effects of the terraces are unknown for the premodern forest types, but they are of significance in

the modern context. Review of terraces in adjacent drainages (Smith 1979a, 1979b, 1980) indicates that Grenada, Calloway, and Henry soils characterize the terraces, while Waverly and Falaya soils make up the current floodplain. The uplands are composed mainly of Memphis, Loring, and Grenada soils. Of crucial importance in this context is the tendency of shagbark and scalybark hickories to form groves on Grenada and Calloway soils on terraces, while the upland species are predominantly those too high in tannic acid for human use without special processing. Other important terrace forest species would have been pin oak, red oak, cottonwood, sycamore, sweet gum, and persimmon. The variety of understory species includes vines, shrubs, herbaceous plants, and cane. Floodplain forests include tupelo, red gum, cypress, willow, and a variety of other tree species. As in the uplands, cane is an important understory species, along with a wide variety of shrubs, vines, and seasonal herbs.

Upland forests consisted of red and white oaks with upland hickories as the primary species. Major secondary species included elm, chestnut, yellow (tulip) poplar, sweetgum, and walnut in the canopy, and dogwood, cherry, mulberry, persimmon, sassafras, and winged elm in the understory. Again, a wide range of shrubs, vines, and herbs is present. Plant resources are thus generally diffuse in distribution, except for the seasonal occurrence of shagbark and scalybark hickory nuts in groves on terraces.

The primary game animals of the area are white-tailed deer, turkey, rabbit, black bear, opossum, and raccoon.

Ducks, geese, and passenger pigeons would have been important seasonal game species. Fish and turtles would have been available in permanent streams of the drainage such as Black Bayou and Nonconnah, Cane, and Johns Creeks, as well as seasonal streams and ponds. Animal food resources may thus be characterized as diffuse in nature except for possible seasonal concentrations of migratory birds.

Siliceous lithic resources occur near the drainage as chert and quartzite gravels outcropping from below the Pleistocene loess in the bed of Loosahatchie River, and at the base of the Mississippi River bluffs. Ferruginous sandstone and siltstone are readily available in a broad band stretching through west-central Tennessee and central Mississippi, occurring within 30 miles east of the drainage basin. The ferruginous siltstone was widely used in the region for atlatl weights, gorgets, celts, and a variety of generalized rough bifacial tools.

Resource distribution in the drainage thus includes those of diffuse distribution, such as most of the plants and game mammals, and those of linear distribution such as lithic and aquatic resources. The key concentrated resources include fall shagbark and scalybark hickory nuts in the groves on Grenada and Calloway soils on terraces, and fall and spring migratory waterfowl in areas of seasonally standing water. Hickory nuts thus appear to be the most strategic resource, in localized concentrations between aquatic and upland resources at the beginning of the season when storable food supplies

would be most crucial to the survival of nonagricultural human populations.

The very conditions which appear to favor the formation of shagbark and scalybark hickory groves, namely a shallow fragipan producing waterlogged soil through late spring or even early summer (Flowers 1964:6, 11), also sharply reduce the utility of these soils for agriculture. Such soils are difficult to work until late in the planting season, are subject to wet-year moisture damage to crops, and provide an effective barrier to root growth during dry years.

Prehistoric agricultural activities tend to focus on better-drained soils such as Collins, Memphis, Loring, or upland Granada soils. Collins soils are usually too low in this drainage for effective use, but represent the general class of sandy soils particularly favored by agriculturalists using hand tools. Loess soils such as Memphis and Loring tend to be used effectively only by those equipped with iron or steel implements, usually operated with draft animals or machines to augment human physical strength.

Environmental factors would thus appear to favor several different subsistence-settlement considerations. The diffuse distribution of the primary game animals suggests that hunting activity would occur throughout the drainage with little point concentration other than a search for seasonal waterfowl. Sharp restriction of the distribution of shagbark and scalybark hickory resources suggest that areas of Grenada and Calloway soils on terraces would have been particularly important for

fall gathering activities. Sandy soils are generally considered of particular importance to agriculturalists using only hand tools, provided that drainage conditions are suitable. The upland loessic soils would have been of particular agricultural interest to nineteenth-century Euro-American settlers with their iron plows, but not to prior occupants without such equipment.

Literature Search

The literature on the Big Creek drainage proper consists entirely of environmental impact studies done for various agencies. Numerous studies of neighboring areas exist and are heavily drawn upon for comparative data in the various reports. All of the reports involved are primarily based upon survey work conducted between 1955 and 1981.

Early reports by Smith (1974) and Peterson (1979b) provide brief summaries of significant sites by identifiable components represented, but provide no artifact descriptions or data summaries. Additional fieldwork in the form of random transects was conducted in 1979 by Gilbert Commonwealth Associates, Inc. (1981) but produced no additional sites and little new information about the previously recorded ones.

In addition to published accounts including cultural resources of the Big Creek drainage, several other potential sources of information were checked. These included site records on file at the Chucalissa Museum, Memphis State University, and maps, reports, and aerial photographs at the Memphis Room

of the Memphis Public Library. Particularly useful were 1940s and '50s 15-minute quadrangle maps and 1931 and '63 aerial photographs of the project area. This review indicated no sites within the project area.

An interview April 2, 1990 with Mr. Jack Huffman, Millington Director of Public Works, delineated project area sectors affected by post-1960 dredging and landfill operations. He characterized the area as open cotton fields prior to that time, when active development began.

Cultural Background

General Summary

The cultures represented in the Big Creek drainage fall within the basic framework of western Tennessee as outlined in studies of the other Mississippi River drainages (Smith 1972, 1979c, 1980; Peterson 1979a, 1979b). The primary prehistoric cultural periods include Paleoindian, Archaic, Woodland, and Mississippian, each with various subdivisions based on time span and content.

Paleoindian components are characterized by a variety of large, fluted projectile point types; scrapers, perforators, and gravers often made on ribbon-like blades of flint or chert; and prepared cores from which blades were struck. Flakes and nonblade cores are also present, but not distinct from those of later periods. Subsistence is conventionally considered to have been based primarily upon hunting large game animals.

Social and settlement systems are thought to have consisted of small bands of kinsmen following the movement of game animals, often Pleistocene megafauna. The estimated time span of this period is about 10,000 to 8500 B.C.

The Archaic period is a long post-Pleistocene period characterized by progressively increasing emphasis on plant foods as the primary subsistence base, along with increasing social complexity. Introduction of woodworking tools and grindstones, along with use of a variety of notched projectile points characterizes the Early Archaic. The points appear designed for use with spear throwers on swift-moving game such as deer rather than as thrusting spears usable on slow-moving game unlikely to flee. The blade tools characteristic of the Paleoindian period seem to have gone out of use by the end of the Early Archaic. Lower-grade and/or smaller-sized raw materials locally available replaced the relatively uncommon grades and sizes of raw material necessary for the blade-based tools and weapons. The Early Archaic is generally thought to range from 8500 to 5500 B.C.

Middle Archaic components in neighboring areas are characterized by stemmed projectile points, often large and formed by minimal flaking, and ground stone tools and ornaments. The period is particularly poorly known in the region. A time span of about 5500-3500 B.C. or even as late as 2000 B.C. is often cited for the period.

The Late Archaic is characterized by a variety of large-stemmed point types, ground stone tools and ornaments. Many

sites of the period are much larger than those of previous periods. It was during this period that a series of incipient changes occurred in the subsistence and social systems; changes that would continue through the rest of the prehistoric sequence. Among these were the beginnings of plant domestication, long-range trade in exotic raw materials and finished items, and increasingly complex social organization with definable status positions. Subsistence patterns emphasize exploitation of seasonally concentrated resources. Regional stylistic traditions of distinctive point types occur throughout the eastern United States, involving much smaller areas than in previous periods. The Loosahatchie drainage includes the frontier between one tradition centered in the northern Mississippi Alluvial Valley and another centered in the western portion of the Tennessee River valley.

The time span of the Late Archaic period varies considerably from one area to another, basically from the local end of the Middle Archaic to the beginning of the following period. The beginning of the period in the Midsouth is variably placed at either about 3500 B.C. or 2000 B.C., depending on the assignment of the Benton complex; the 3500 B.C. date will be used here. The end date of the period also varies according to the treatment and definition of the following period, usually Woodland. The nonpottery-using Poverty Point cultural tradition of the Mississippi Valley has variously been considered part of the Late Archaic, a separate cultural period in its own right (Phillips 1970), or ambiguously labelled "Transitional" (Peterson 1979a, 1979b). The Poverty Point-related cultures

will here be considered part of a separate Poverty Point period, thus placing the end of the Late Archaic at about 1500 to 1000 B.C. in the Midsouth.

The terminal Archaic period includes a Poverty Point-derived cultural phenomenon restricted to the Mississippi River alluvial valley and adjacent areas. It is marked by a distinctive series of projectile point, tool, and ornament types and by fired clay objects of various styles apparently used in earth-oven cooking. Particularly distinctive items, other than the point types, are a microblade industry and insect-effigy stone beads. The focal site of the period in northern Louisiana was involved in extensive trade with contemporary cultures generally considered Late Archaic and/or Early Woodland, and is known to have utilized items from as far away as Indiana. The time span of the period approximates 1500-400 B.C., with some local variation.

The Early Woodland period in the area is marked by the appearance of local ceramics, although complexes to the east, which are usually considered Late Archaic, had already been using pottery for several centuries. Point styles are derived from previous late Poverty Point styles. Burial mounds are thought to have come into use during this period. The local ceramic styles are typical of those of the lower Mississippi River valley, although the use of sandy ceramic paste and cordmarked surface finishes appear by the end of the period. A time span of about 400 B.C. to A.D. 100 would be the likely maximum for the period locally, with a span as short as 200 B.C. to A.D. 1 possible.

Middle Woodland culture in the Midsouth is most closely related to the Miller tradition derived from the upper Tombigbee River drainage. It is characterized by sand-tempered ceramics with plain and cordmarked surface finishes. Point styles appear to continue the stemmed forms of the previous period. Burial mounds continue in use, while flat-topped mounds also appear at some major centers. An estimated time span for the period is about A.D. 100-400.

Late Woodland occupation in the area is closely tied to the Mississippi River alluvial valley and immediately adjacent areas. Characteristic artifacts include clay-tempered plain, cordmarked, and check-stamped pottery; and small, thin stemmed-to-corner-notched points probably used on arrows. Burial mounds continue in use. The approximate time span of the period is A.D. 400-900.

Mississippian culture in the area is also closely tied to the Mississippi River alluvial valley. It is characterized by plain, incised, engraved, and painted ceramics in a variety of forms; triangular and willow-leaf-shaped arrow points; a hierarchy of site form ranging from camps, hamlets, and villages, through villages with one or two mounds facing a central plaza, to major centers with multiple large platform mounds facing one or more plazas. Large-scale corn agriculture, supplemented by other crops, hunting, and fishing provided the subsistence base. Social systems may well have involved

tribes at the beginning of the period, but are generally considered to have become complex chiefdoms by the period's end. Early Mississippian ceramics are relatively simple and clay-tempered, but the change to shell-tempered wares had taken place by about A.D. 1200. The total local span of the period approximates A.D. 900-1500. The period was probably effectively ended locally by a virtual total depopulation brought about through epidemics of European and African diseases immediately after the passage of the DeSoto expedition through the area in 1541.

The colonial/pre-Jackson Purchase period is very poorly known for the area. There appears to have been little or no permanent occupation until the establishment of a Spanish fort at the mouth of the Wolf River in 1793 (S. Smith 1982) and its associated trading post activity. The Marquette and Joliet, LaSalle, and other expeditions passed by or through the area without leaving a known trace, as did the Bienville expedition of 1736 which the French launched against the Chickasaw. Little is known of the pre-1818 settlement of scattered squatters over the area. After the Jackson Purchase of western Tennessee and Kentucky from the Chickasaws in 1818 legitimized Anglo-America settlement, the area filled rapidly.

Most of the primary towns and roads in Shelby County were established by 1840, although smaller towns often did not hasten into the formalities of a charter or government until later

Field Methods and Results

Field methods included pedestrian survey, shovel testing, and excavation of a formal test unit. Shovel testing was conducted at 30-meter intervals eastward from the central part of the city of Millington Public Works complex and immediately west of that complex adjacent to a refilled borrow area (Fig. 1).

Survey of the borrow area for this project indicated that the northern edge of a newly-discovered lithic scatter, 40SY514, extends into the impact area. The total site collection consists of a Dalton projectile point base, 5 chert flakes, 2 broken chert cobbles, 1 chert core, a possible quartz scraper, and 1 hammerstone. Of this material, one of the flakes and a broken cobble were from the initially proposed impact zone (Fig. 2). Shovel tests were placed across the site to check for surviving midden, but revealed none. A one-meter test unit was also excavated in the impact area portion of the site (Fig. 2), with all soil sifted through $\frac{1}{4}$ -inch mesh screen. Plow zone in the test unit approximated 20 cm in depth (Fig. 3), below which was approximately 10 cm of yellow-brown loess overlying a zone of light greyish-brown silty clay extending at least another 35 cm. No cultural materials were recovered from any soil zone.

Recommendations

Since no sites were found on this or previous surveys on the north side of the creek, that area does not appear to need further investigation. Areas outside the tested sector

are either covered with recent landfill or extensively disturbed by borrow pits or construction accompanying apartment and subdivision development.

Soils in the borrow pit and adjacent areas (Sease et al. 1970) are Henry Silt Loam, Falaya Silt Loam, Collins Silt Loam, and Calloway Silt Loam. The Calloway soil is typical of low terrace contexts. Henry soils occur in both floodplain and low terrace contexts, while the rest are floodplain soils. In this case the Henry soil of the borrow pit area appears to be in a low terrace context. The terrace involved would be among the most recent in the drainage, probably no earlier than the late portion of the Wisconsin glacial period.

The site is typical of small lithic scatters throughout western Tennessee, producing only a few flakes and cobbles, and a single projectile point fragment with the primary concentration in an area extending from 200 to 300 feet (60 to 90 meters) south of the impact zone boundary. Recovery of a flake and cobble from within the impact zone combined with the Dalton identity of the point led to testing to determine whether or not significant remains were present in the impact zone. No surviving deposits or even artifacts were encountered in the test excavation. Since no cultural materials were recovered in the test work, the main site concentration is small and twice its diameter from the impact area, numerous other sites producing Dalton (Cambron and Hulse 1964) points

are known from the Loosahatchie drainage, and the project boundaries have been revised to avoid the site, no further work is recommended for this site unless the impact area is expanded southward across it.

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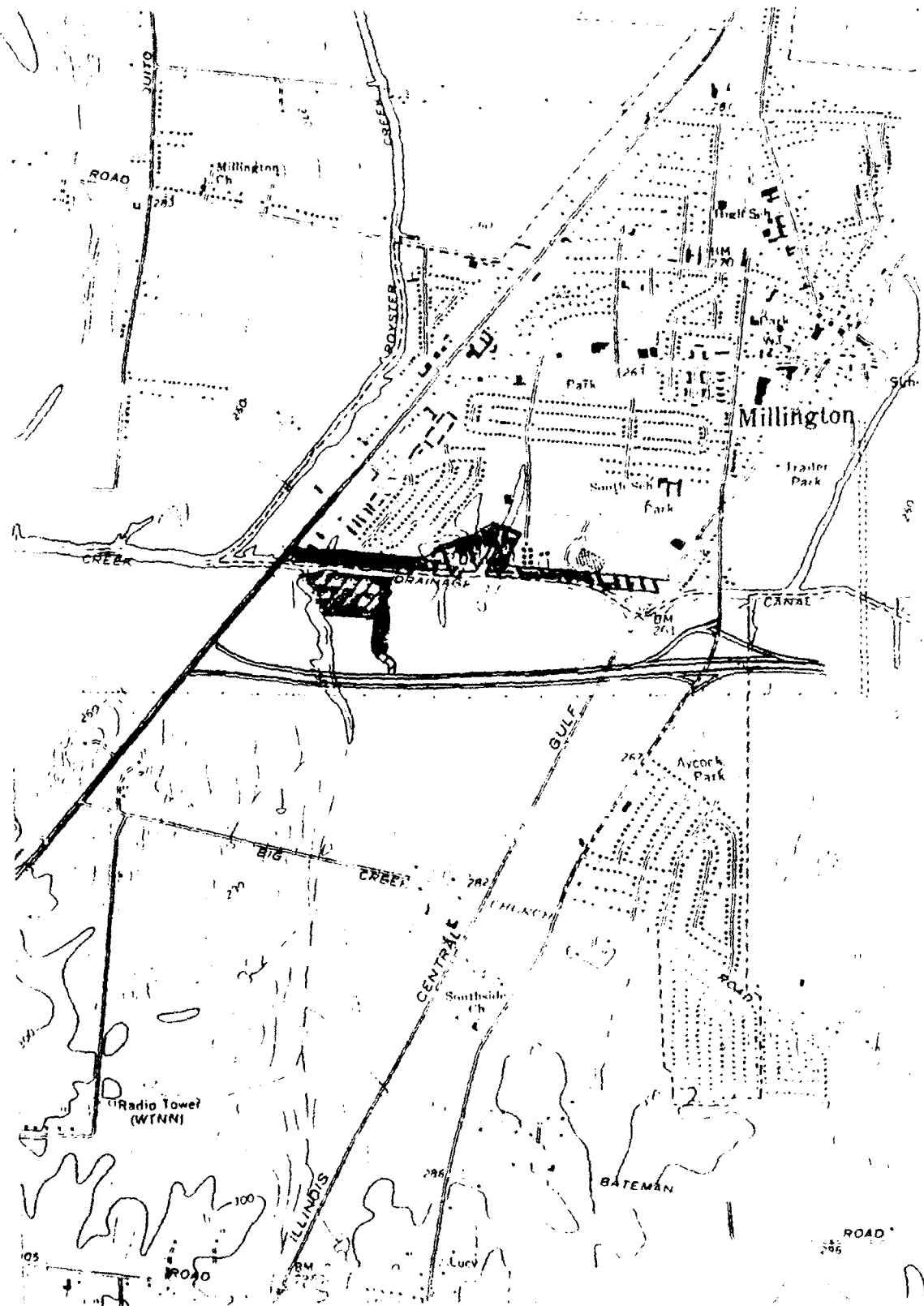


Figure 1. Project Location.

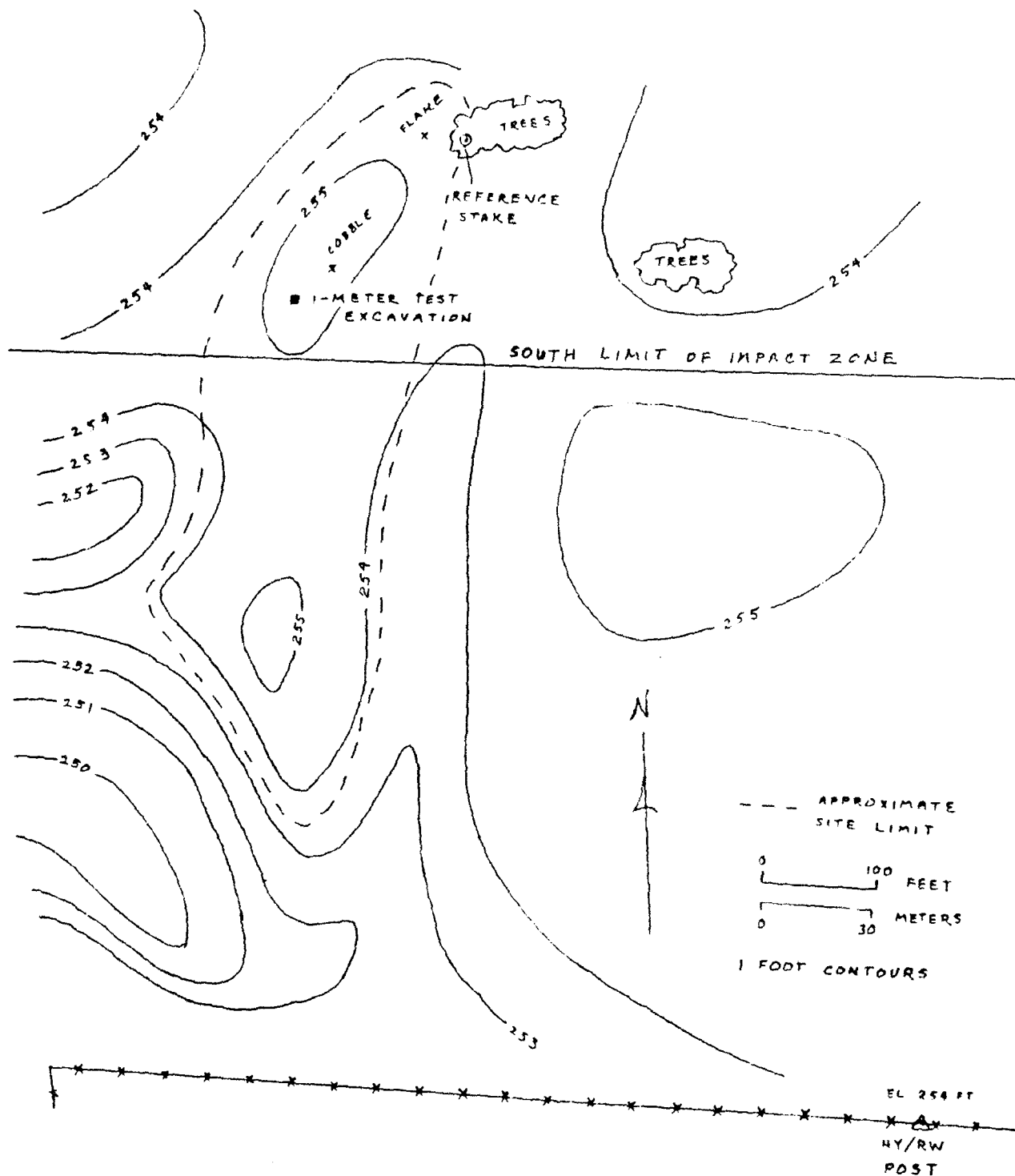


Figure 2. Site and Impact one Boundaries with Test Pit,

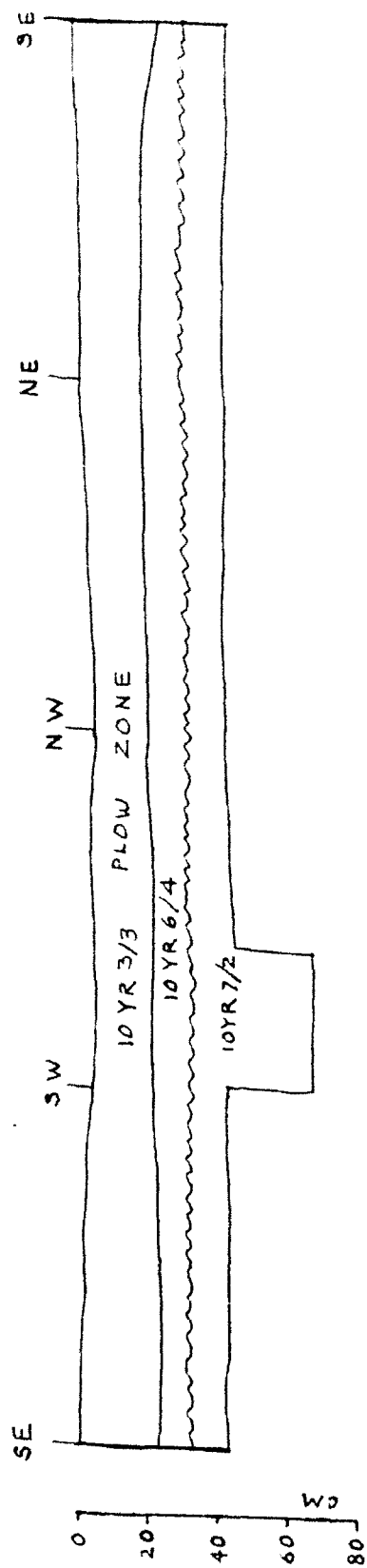
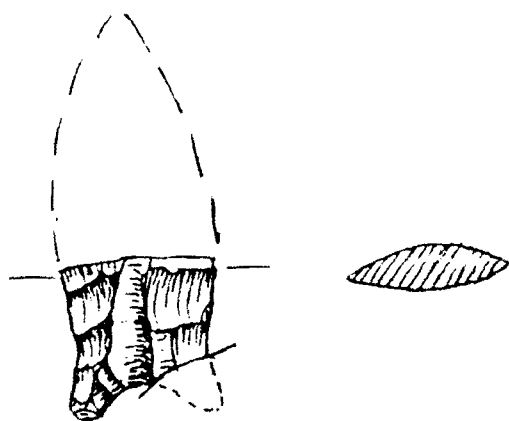
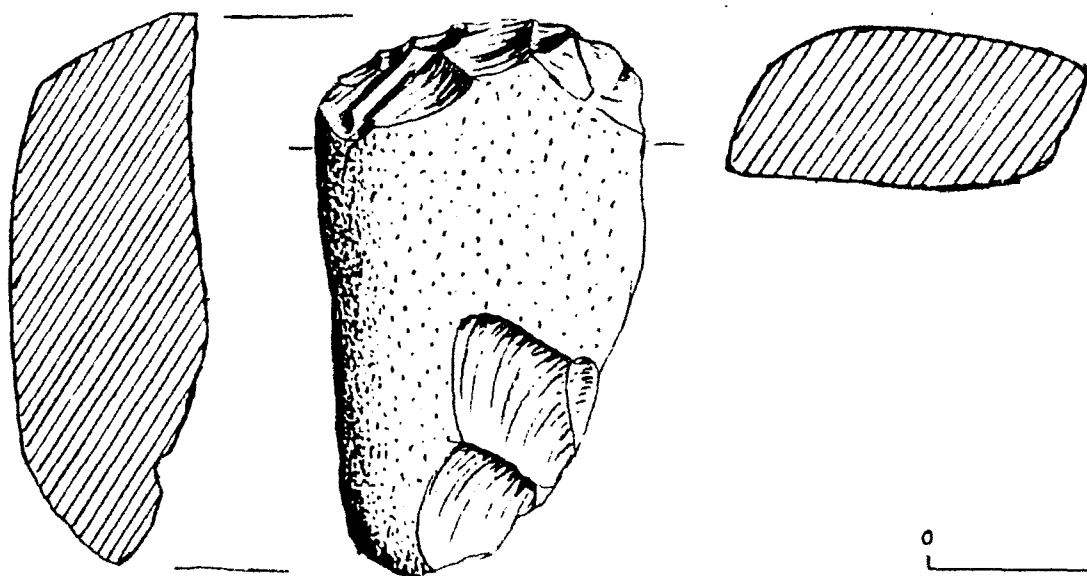


Figure 3. Site Test Excavation Profiles.



A.



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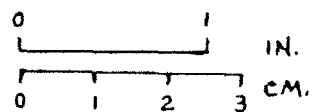


Figure 4. A. Dalton projectile point base. B. Possible quartzite scraper.

DESCRIPTION/SPECIFICATIONS

A CULTURAL RESOURCES INTENSIVE SURVEY, WITH TESTING, OF THE MILLINGTON NAVAL BASE LEVEE CONSTRUCTION SITE, MILLINGTON, SHELBY COUNTY, TENNESSEE

1-1. General Scope of Services. The types of services to be performed by the Contractor include:

a. A Cultural Resources Background and Literature Searches, Intensive Survey and Site Surface and Subsurface Evaluations at the Millington Naval Base Levee Construction Site, Shelby County, Tennessee.

b. Detailed analysis of data obtained from fieldwork and other sources for the purpose of determining site significance with respect to National Register of Historic Places or to supply data prerequisite to performance of other work tasks.

c. Compilation and synthesis of all necessary data for making determinations of cultural resources site eligibility for the National Register of Historic Places, including preparation of National Register nomination forms.

d. Written cultural resources assessments and evaluations for environmental impact statements, environmental assessments, and other project documents.

e. Preparation of technical reports containing results of work accomplished under this contract.

1.2. Legal Contexts. Tasks to be performed are in partial fulfillment of the Memphis District's obligations under the National Historic Preservation Act of 1966 (P.L. 89-665), as amended; the National Environment Policy Act of 1969 (P.L. 91-190); Executive Order 11593, "Protection and Enhancement of Cultural Environment; the Archaeological Resources Protection Act of 1979 (PL 96-95); and the Advisory Council on Historic Preservation, "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

1.3. Personnel Standards.

a. The Contractor shall utilize a systematic, interdisciplinary approach to conduct the study. Specialized knowledge and skills will be used during the course of the study to include expertise in archeology, prehistory, ethnology, history, architecture, geology and other disciplines as required to fulfill requirements of this Scope of Work. Techniques and methodologies used for the study shall be representative of the state of current professional knowledge and development.

b. The following minimal experiential and academic standards shall apply to personnel involved in investigations described in this Scope of Work:

(1) Archeological Project Directors or Principal Investigator(s) (PI). Individuals in charge of an archeological project or research investigation contract, in addition to meeting the appropriate standards for archeologists, must have a publication record that demonstrates extensive experience in

successful field project formulation, execution and technical monograph reporting. Unless otherwise directed by the Contracting Officer, it will be mandatory that at least one individual actively participating as Principal Investigator or Project Director under this contract, have demonstrated competence and ongoing interest in relevant research domains in the Southeast Missouri Region. Extensive prior research experience as Principal Investigator or Project Director in immediately adjacent areas will also satisfy this requirement. The requirement may also be satisfied by utilizing consulting co-principal Investigators averaging no less than 25% of Principal Investigator paid hours for the duration of contract activities. Changes in any Project Director or Principal Investigator during a delivery order must be approved by the Contracting Officer. The Contracting Officer may require suitable professional references to obtain estimates regarding the adequacy of prior work.

(2) Archeologist. The minimum formal qualifications for individuals practicing archeology as a profession are a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study or equivalent with concentration in anthropology and specialization in archeology and at least two summer field schools or their equivalent under the supervision of archeologists of recognized competence. A Master's thesis or its equivalent in research and publication is highly recommended, as is the M.A. degree.

(3) Architectural Historian. The minimum professional qualifications in architectural history are a graduate degree in architectural history, historic preservation, or closely related fields, with course work in American architectural history; or a bachelor's degree in architectural history, historic preservation, or closely related field plus one of the following:

(a) At least two years full-time experience in research, writing, or teaching in American history or restoration architecture with an academic institution, historical organization or agency, museum, or other professional institution; or

(b) Substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history.

(4) Other Professional Personnel. All other personnel utilized for their special knowledge and expertise must have a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study with concentration in appropriate study and a publication record demonstrating competing in the field of study.

(5) Other Supervisory Personnel. Persons in any supervisory position must hold a B.A., B.S. or M.A. degree with a concentration in the appropriate field of study and a minimum of 2 years of field and laboratory experience in tasks similar to those to be performed under this contract.

(6) Crew Members and Lab Workers. All crew members and lab workers must have prior experience compatible with the tasks to be performed under this contract.

c. All operations shall be conducted under the supervision of qualified Professionals in the discipline appropriate to the data that is to be

discovered, described or analyzed. All contract related activities shall be performed consistent with the Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation, and the Society of Professional Archeology's Code of Ethics and Standards. Vitae of personnel involved in project activities may be required by the Contracting Officer at anytime during the period of service of this contract.

1.4. The Contractor shall designate in writing the name or names of the Principal Investigator(s). In the event of controversy or court challenge, the Principal Investigator shall be available to testify with respect to report findings. The additional services and expenses will be at Government expense, per paragraph 1.9 below.

1.5. The Contractor shall keep standard field records which may be reviewed by the Contracting Officer. These records shall include field notes, appropriate state site survey forms and any other cultural resource forms and/or records, field maps and photographs necessary to successfully implement requirements of the Scope of Work.

1.6. To conduct field investigations, the Contractor will obtain all necessary permits, licenses; and approvals from all local, state and Federal authorities. Should it become necessary in the performance of the work and services of the Contractor to secure the right of ingress and egress to perform any of the work required herein on properties not owned or controlled by the Government, the Contractor shall secure the consent of the owner, his representative, agent, or leasee, prior to effecting entry and conduct the required work unless otherwise notified by Contracting Officer on such property.

1.7. Innovative approaches to data location, collection, description and analysis, consistent with other provisions of this contract and the cultural resources requirements of the Memphis District, are encouraged.

1.8. No mechanical power equipment other than that referenced in paragraph 3.7. shall be utilized in any cultural resource activity without specific written permission of the Contracting Officer.

1.9. The Contractor shall furnish expert personnel to attend conferences and furnish testimony in any judicial proceedings involving the archeological and historical study, evaluation, analysis and report. When required, arrangements for these services and payment therefor will be made by representatives of either the Corps of Engineers or the Department of Justice.

1.10. The Contractor, prior to the acceptance of final reports, shall not release any sketch, photographs, report or other material of any nature obtained or prepared under this contract without specific written approval of the Contracting Officer.

1.11. The extent and character of the work to be accomplished by the Contractor shall be subject to the general supervision, direction control and approval of the Contracting Officer. The Contracting Officer may have a representative of the Government present during any or all phases of Scope of Work requirements.

1.12. The Contractor shall obtain Corps of Engineers Safety Manual (EM 385-1-1) and comply with all appropriate provisions. Particular attention is directed to safety requirements relating to the deep excavation of soils.

1.13. There will be two categories of meetings between Contractor and Contracting Officer: (1) scheduled formal meetings to review contract performance, and (2) informal, unscheduled meetings for clarification, assistance, coordination and discussion. The initial meeting may be held prior to the beginning of field work. Category (1) meetings will be scheduled by the Contracting Officer and will be held at the most convenient location, to be chosen by the Contracting Officer. This may sometimes be on the project site, but generally will be at the office of the Contracting Officer.

2. DEFINITIONS.

2.1. "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archeology, or culture of an area.

2.2. "Background and Literature Search" is defined as a comprehensive examination of existing literature and records for the purpose of inferring the potential presence and character of cultural resources in the study area. The examination area may also serve as collateral information to field data in evaluating the eligibility of cultural resources for inclusion in the National Register of Historic Places or in ameliorating losses of significant data in such resources.

2.3. "Intensive Survey" is defined as a comprehensive, systematic and detailed on-the-ground survey of an area, of sufficient intensity to determine the number, types, extent and distribution of cultural resources present and their relationship to project features.

2.4. "Mitigation" is defined as the amelioration of losses of significant prehistoric, historic, or architectural resources which will be accomplished through preplanned actions to avoid, preserve, protect, or minimize adverse effect upon such resources or to recover a representative sample of the data they contain by implementation of scientific research and other professional techniques and procedures. Mitigation of losses of cultural resources includes, but is not limited to, such measures as: (1) recovery and preservation of an adequate sample of archeological data to allow for analysis and published interpretation of the cultural and environmental conditions prevailing at the time(s) the area was utilized by man; (2) recording, through architectural quality photographs and/or measured drawings of buildings, structures, districts, sites and objects and deposition of such documentation in the Library of Congress as a part of the National Architectural and Engineering Record; (3) relocation of buildings, structures and objects; (4) modification of plans or authorized projects to provide for preservation of resources in place; (5) reduction or elimination of impacts by engineering solutions to avoid mechanical effects of wave wash, scour, sedimentation and related processes and the effects of saturation.

2.5. "Reconnaissance" is defined as an on-the-ground examination of selected portions of the study area, and related analysis adequate to assess the general nature of resources in the overall study area and the probable impact on resources of alternative plans under consideration. Normally reconnaissance will involve the intensive examination of not more than 15 percent of the total proposed impact area.

1.6. "Significance" is attributable to those cultural resources of historical, architectural, or archeological value when such properties are included in or have been determined by the Secretary of the Interior to be eligible for inclusion in the National Register of Historic Places after evaluation against the criteria contained in 36 CFR 63.

1.7. "Testing" is defined as the systematic removal of the scientific, prehistoric, historic, and/or archeological data that provide an archeological or architectural property with its research or data value. Testing may include controlled surface survey, shovel testing, profiling, and limited subsurface test excavations of the properties to be affected for purposes of research planning, the development of specific plans for research activities, excavation, preparation of notes and records, and other forms of physical removal of data and the material analysis of such data and material, preparation of reports on such data and material and dissemination of reports and other products of the research. Subsurface testing shall not proceed to the level of mitigation.

1.8. "Analysis" is the systematic examination of material data, environmental data, ethnographic data, written records, or other data which may be prerequisite to adequately evaluating those qualities which contribute to their significance.

2. STUDY AREA

2.1. Study Area

The project area is located in the town of Millington, TN (see attached topographic map "Millington" 7.5 minutes). The project begins at the intersection of Big Creek and Highway 51, and extends approximately 1 mile to the intersection of Big Creek and the Illinois Central Railroad. The right-of-way extends from top bank 200 feet northward. Near the center of the survey area, the right-of-way follows a ditch approximately 500 feet northward. This area is included in the survey. Also included are four culvert extensions. Enclosed blue-line drawings show these features. The entire area includes approximately 30 acres.

South of Big Creek, near Highway 51, a borrow pit and haul road are located. The borrow pit is approximately 1,000 feet by 500 feet. The haul road is approximately 600 feet long and 20 feet wide. This area contains approximately 12 acres. See attached topographic map and blue-line drawings.

The entire project covers approximately 42 acres.

3. GENERAL PERFORMANCE SPECIFICATIONS.

3.1. Research Design.

Survey, testing and data recovery shall be conducted within the framework of a regional research design including, where appropriate, questions discussed in the State Plan. All typological units not generated in these investigations shall be adequately referenced. It should be noted that artifactual typologies constructed for other areas may or may not be suitable for use in the study area. It is, therefore, of great importance that considerable effort be spent

in recording and describing artifactual characteristics treated as analytically diagnostic in this study as well as explicit reasons for assigning (or not assigning) specific artifacts to various classificatory units. Specific requirements of research designs undertaken as individual work items will be listed in delivery orders.

3.2. Background and Literature Search.

a. This task shall include an examination of the historic and prehistoric environmental setting and cultural background of the study area and shall be of sufficient magnitude to achieve a detailed understanding of the overall cultural and environmental context of the study area. It is axiomatic that the background and literature search shall normally precede the initiation of all fieldwork.

b. Information and data for the literature search shall be obtained, as appropriate, from the following sources: (1) Scholarly reports - books, journals, theses, dissertations and unpublished papers; (2) Official Records - federal, state, county and local levels, property deeds, public works and other regulatory department records and maps; (3) Libraries and Museums - both regional and local libraries, historical societies, universities, and museums; (4) Other repositories - such as private collections, papers, photographs, etc.; (5) Archeological site files at local universities, the State Historic Preservation Office, the office of the State Archeologist; (6) Consultation with qualified professionals familiar with the cultural resources in the area, as well as consultation with professionals in associated areas such as history, sedimentology, geomorphology, agronomy, and ethnology.

c. The Contractor shall include as an appendix to the draft and final reports, written evidence of all consultation and any subsequent response(s), including the dates of such consultation and communications.

d. The background and literature search shall be performed in such a manner as to facilitate the construction of predictive statements (to be included in the study report) concerning the probable quantity, character, and distribution of cultural resources within the project area. In addition, information obtained in the background and literature search should be of such scope and detail as to serve as an adequate data base for subsequent cultural resources work undertaken for the purpose of discerning the character and significance of specific cultural resources or for the construction of research designs undertaken in conjunction with future area cultural resources tasks.

4.3. Intensive Survey

a. Intensive survey shall include the on-the-ground examination of the entire study area.

b. Unless excellent ground visibility and other conditions conducive to the observation of cultural evidence occurs, shovel test pits, or comparable subsurface excavation units, shall be installed at intervals no greater than 30 meters throughout the study area. Note that auger samples, probes, and coring tools will not be considered comparable subsurface units. Shovel test pits shall be minimally 30 x 30 centimeters in size and extend to a minimum depth of 50 centimeters. Unit fill material shall be screened using 1/2" mesh hardware cloth. Additional shovel test pits shall be excavated in areas judged by the

principal Investigator to display a high potential for the presence of surface and near surface cultural resources deposits. All shovel test pits shall be refilled. If, during the course of intensive survey activities, areas are encountered in which disturbance or other factors clearly and decisively preclude the possible presence of significant cultural resources, the Contractor shall carefully examine and document the nature and extent of the factors and then proceed with survey activities in the remainder of the study area. Documentation and justification of such action shall appear in the survey report. The location of all shovel test units and surface observations shall be recorded and shown in the report of investigations.

c. When cultural remains are encountered, preliminary horizontal site boundaries shall be derived by the use of surface observation procedures. The Contractor shall establish a primary site datum at the discovered cultural loci which shall be precisely related to a permanent reference point (in terms of azimuth and distance) by means of a transit level. If possible, the permanent reference point used shall appear on Government blue-line (project) drawings and/or 7.5 minute U.S.G.S. quad maps. If no permanent landmark is available, a permanent datum, consisting minimally of a metal rod, shall be established in a secure location for use as a reference point. The permanent datum shall be precisely plotted and shown on U.S.G.S. quad maps and project drawings. All descriptions of site location shall refer to the location of the primary site datum.

d. All standing buildings and structures (other than those patently modern, i.e., less than 50 years old) shall be recorded and described. For a building to be considered "standing" it must retain four walls and at least a skeletal roof structure. A building or structure found in the field to be partially or totally collapsed will be considered an archeological site. In these cases, general data concerning construction materials and techniques and floor plan, if discernible, must be collected. The Contractor shall supply preliminary information concerning the suitability of a structure or building for relocation and restoration (structural soundness for example).

e. For each archeological site or architectural property recorded during the survey, the Contractor shall complete and submit the standard state archeological site or architectural property survey form, respectively. The Contractor shall be responsible for reproducing or obtaining a sufficient quantity of these forms to meet the needs of the project. The Contractor shall be responsible for coordinating with the appropriate state agency to obtain state site-file numbers for each archeological site and architectural property recorded.

4.4. Site Surface Evaluation

a. Surface collection of the site area shall be accomplished in order to obtain data representative of total site surface content. Both historic and prehistoric items shall be collected. The Contractor shall carefully note and report descriptions of surface conditions of the site including ground cover and the suitability of soil surfaces for detecting cultural items (ex: recent rainfall, standing water or mud). If ground surfaces are not highly conducive to surface collection, screened shovel test units shall be used to augment surface collection procedures. It should be noted, however, that such units should be substituted for total surface collection only where the presence of ground cover requires such techniques.

b. Care should be taken to avoid bias in collecting certain classes of data or artifact types to the exclusion of others (ex: debitage or faunal remains) so as to insure that collections accurately reflect both the full range and the relative proportions of data classes present (ex: the proportion of debitage to finished implements or types of implements to each other). Such a collecting strategy shall require the total collection of quadrat or other sample units in sufficient quantities to reasonably assure that sample data are representative of such discrete site subareas as may exist. Since the number and placement of such sample units will depend, in part, on the subjective evaluation of intrasite variability, and the amount of ground cover, the Contractor shall describe in the study report the rationale for the number and distribution of collection units. In the event that the Contract utilizes systematic sampling procedures in obtaining representative surface samples, care should be taken to avoid periodicity in recovered data. No individual sample unit type used in surface data collection shall exceed 36 square meters in area. Unless a smaller fraction is approved by the Contracting Officer, surface collected areas shall constitute no less than 25 percent of total site areas. No two surface collection units shall be adjacent to each other. Detailed results of controlled surface collections shall be graphically depicted in plan view in the report of investigations.

c. The Contractor shall undertake (in addition and subsequent to sample surface collecting) a general site collection in order to increase the sample size of certain classes of data which the Principal Investigator may deem rerequisite to an adequate site-specific and intersite evaluation of data.

d. As an alternative to surface collecting procedures discussed above, where surface visibility is excellent, the Contractor may collect all visible artifacts. If such a procedure is undertaken, the precise proveniences of all individual artifacts shall be related to the primary site datum by means of a transit level.

4.5. Subsurface Testing/Evaluation

a. Subsurface testing and evaluation may include but not be limited to the excavation of formal test units, excavation of informal test units (ex: shovel tests), block excavations, mechanical excavation, stripping and feature excavation.

b. Subsurface test units (other than shovel cut units) shall be excavated in levels no greater than 10 centimeters. Where cultural zonation or plow disturbance is present however, excavated materials shall be removed by zones (and in 10 cm. levels within zones where possible). Subsurface test units shall extend to a depth of at least 20 centimeters below artifact bearing soils. A portion of each test unit, measured from one corner (of a minimum 30 x 30 centimeters), shall be excavated to a depth of 40 centimeters below artifact bearing soils. All excavated materials (including plow zone material) shall be screened using a minimum of $\frac{1}{8}$ " hardware cloth. Representative profile drawings and photographs shall be made of excavated units. Subsequent to preparation of documentation for each test unit, the unit shall be backfilled and compacted to provide reasonable pedestrian safety.

c. Stringent horizontal spatial control of testing shall be maintained by relating the location of all test units to the primary site datum either by

means of a grid system (including those used in controlled surface collection) or by azimuth and distance.

d. If features are encountered in the excavation of formal units, test units, if necessary, shall be expanded and all feature fill (including floatation samples) shall be removed and documented when such expansion and removal is consistent with the quantity of work specified in the contract delivery order. If such removal exceeds authorized work quantities, only the portion of the feature within the initial test units (including a floatation sample) shall be removed and documented. As appropriate, drawings, piece plotting, photographs and other documentation of feature contents shall be made.

e. If in situ human remains are encountered and all skeletal remains and associated cultural items cannot be properly removed and documented under the terms of the contract and delivery order, burials shall not be excavated but shall be carefully refilled in a manner which will afford maximum protection to the burial in the event of later excavation.

4.6. Laboratory Processing, Analysis and Preservation.

All cultural materials recovered will be cleaned and stored in deterioration resistant containers suitable for long term curation. Diagnostic artifacts will be labeled and catalogued individually. A diagnostic artifact is defined herein as any object which contributes individually to the needs of analysis required by this Scope of Work or the research design. All other artifacts recovered must minimally be placed in labeled, deterioration resistant containers, and the items catalogued. The Contractor shall describe and analyze all cultural materials recovered in accordance with current professional standards. Artifactual and non-artifactual analysis shall be of an adequate level and nature to fulfill the requirements of this Scope of Work. All recovered cultural items shall be catalogued in a manner consistent with Tennessee state requirements. The Contractor shall consult with appropriate state officials as soon as possible following the conclusion of field work in order to obtain information (ex.: accession numbers) prerequisite to such cataloging procedures.

5. Curation.

Efforts to insure the permanent curation of properly cataloged cultural resources materials and project documentation generated by this contract in an appropriate institution shall be considered an integral part of the requirements of this Scope of Work. The Contractor shall pay all cost of the preparation, transportation and permanent curation of records and artifacts. An arrangement for curation shall be confirmed by the Contractor, subject to the approval of the Contracting Officer, prior to the acceptance of final reports.

6. GENERAL REPORT REQUIREMENTS.

6.1. The primary purpose of the cultural resources report is to serve as a planning tool which aids the Government in meeting its obligations to preserve and protect our cultural heritage. The report will be in the form of a comprehensive, scholarly document that not only fulfills mandated legal

requirements but also serves as a scientific reference for future cultural resources studies. As such, the report's content must be not only descriptive but also analytic in nature.

6.2. Upon completion of all field investigation and research, the Contractor shall prepare a report detailing the work accomplished, the results, and recommendations for the for the project area. Copies of the draft and final reports of investigation shall be submitted in a form suitable for publication and be prepared in a format reflecting contemporary organizational and illustrative standards for current professional archeological journals. The final report shall be typed on standard size 8½" x 11" bond paper with pages numbered and with page margins one inch at top, bottom and sides. Photographs, plans, maps, drawings and text shall be clean and clear.

6.3. The report shall include, when appropriate, the following items:

a. Title Page. The title page should provide the following information; the type of task undertaken, the study areas and cultural resources which were assessed; the location (county and state), the date of the report; the contract number; the name of the author(s) and/or the Principal Investigator; and the agency for which the report is being prepared. If a report has been authored by someone other than the Principal Investigator, the Principal Investigator must at least prepare a forward describing the overall research context of the report, the significance of the work, and any other related background circumstances relating to the manner in which the work was undertaken.

b. Abstract. An abstract suitable for publication in an abstract journal shall be prepared and shall consist of a brief, quotable summary useful for informing the technically-oriented professional public of what the author considers to be the contributions of the investigation of knowledge.

c. Table of Contents.

d. Introduction. This section shall include the purpose of the report, a description of the proposed project, a map of the general area, a project map, and the dates during which the investigations were conducted. The introduction shall also contain the name of the institution where recovered materials and documents will be curated.

e. Environmental Context. This section shall contain, but not be limited to, a discussion of probable past floral, faunal, and climatic characteristics of the project area. Since data in this section may be used in the evaluation of cultural resources significance, it is imperative that the quantity and quality of environmental data be sufficient to allow subsequent detailed analysis of the relationship between past cultural activities and environmental variables.

f. Previous Research. This section shall describe previous research which may be useful in deriving or interpreting relevant background data, problem domains, or research questions and in providing a context in which to examine the probability of occurrence and significance of cultural resources in the study area.

Synthesized interrelated corpus of data including those data generated in the present study.

1. References (American Antiquity Style).

m. Appendices (Maps, Correspondence, etc.). A copy of this Scope of Work and, when stipulated by the Contracting Officer, review comments shall be included as appendices to the final report of investigations.

6.4. All of the above items may not be appropriate to all delivery order tasks. Further, the above items do not necessarily have to be in discrete sections so long as they are readily discernable to the reader.

6.5. In order to prevent potential damage to cultural resources, no information shall appear in the body of the report which would reveal precise resource location. All maps which include or imply precise site locations shall be included in reports as a readily removable appendix (e.g.: envelope).

6.6. No logo or other such organizational designation shall appear in any part of the report (including tables or figures) other than the title page.

6.7. Unless specifically otherwise authorized by the Contracting Officer, all reports shall utilize permanent site numbers assigned by the state in which the study occurs.

6.8. All appropriate information (including typologies and other classificatory units) not generated in these contract activities shall be suitably referenced.

6.9. Reports shall contain site specific maps when appropriate. Site maps shall indicate site datum(s), location of data collection units (including shovel cuts, subsurface test units and surface collection units), site boundaries in relation to proposed project activities, site grid systems (where appropriate), and such other items as the Contractor may deem appropriate to the purposes of this contract.

6.10. Information shall be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective and advantageous to communicate necessary information. All tables, figures and maps appearing in the report shall be of publishable quality. Itemized listings of all recovered artifacts by their smallest available proveniences must appear in either the body of the report or as a report appendix.

6.11. Any abbreviated phrases used in the text shall be spelled out when the phrase first occurs in the text. For example use "State Historic Preservation Officer (SHPO)" in the initial reference and thereafter "SHPO" may be used.

6.12. The first time the common name of a biological species is used it should be followed by the scientific name.

6.13. In addition to street addresses or property names, sites shall be located on the Universal Transverse Mercator (UTM) grid.

6.14. Generally, all measurements should be metric.

6.15. As appropriate, diagnostic and/or unique artifacts, cultural resources or

their contexts shall be shown by drawings or photography. Black and white photographs are preferred except when color changes are important for understanding the data being presented. No instant type photographs may be used.

6.16. Negatives of all black and white photographs and/or color slides of all plates included in the final report shall be submitted to the Contracting Officer. Copies of all negatives shall be curated with other documentation.

7. SUBMITTALS.

7.1. Unless otherwise stipulated in the delivery order, the Contractor shall submit 4 copies of the draft report, one unbound original and 50 final report copies with high quality wrap-around binding. In the event more than one series of review comments is determined necessary by the Contracting Officer, additional draft copies may be required.

7.2. When survey is performed, the Contractor shall submit under separate cover, 4 copies of appropriate 15' quadrangle maps (7.5' when available) or other site drawings which show exact boundaries of all cultural resources within the project area and their relationship to project features. Site boundaries shall be entered on construction drawings (when available). Blue-line drawings will be supplied by the Government.

7.3. The Contractor shall submit to the Contracting Officer completed National Register forms including photographs, maps, and drawings in accordance with the National Register Program, if any sites inventoried or tested is found to meet the criteria of eligibility for nomination and for determination of significance. The completed National Register forms shall be submitted with the final report.

7.4. At any time during the period of service of this contract, upon the written request of the Contracting Officer, the Contractor shall submit, within 15 calendar days, any portion or all field records described in paragraph 1.5. without additional cost to the Government.

7.5. When cultural resources are located during contract activities, the Contractor shall supply the appropriate State Historic Preservation Office with completed site forms, survey report summary sheets, maps or other forms as appropriate. Blank forms may be obtained from the State Historic Preservation Office. Copies of such completed forms and maps shall be submitted to the Contracting Officer within 30 calendar days of the end of fieldwork.

7.6. Documentation. The Contractor shall submit detailed monthly progress reports to the Contracting Officer by the 7th day of every month for the duration of the contract. These reports will contain an accurate account of all field work, laboratory procedures and results in sufficient detail to allow monitoring of project progress.

7.7. Additional submittals may be required.

8. SCHEDULE.

8.1. The Contractor shall, unless delayed due to causes beyond his control and without his fault or negligence, complete all work and services under this contract within the following time limitations.

<u>Activity</u>	<u>Completion Time (in calendar days beginning with acknowledged date of receipt of notice to proceed)</u>
Begin Survey	5
Field work completed	12
Management Summary	15
Submittal of Draft Report	30
Government Review	60
Submittal of Final Report	80

8.2. The Contractor shall make any required corrections to reports after review by the Contracting Officer. The Contracting Officer may defer Government review comments pending receipts of review comments from the State Historic Preservation Officer or reviewing agencies. More than one series of draft report corrections may be required. In the event that the government review period (50 days) is exceeded and upon request of the Contractor, the contract period will be extended automatically on a calendar day for day basis. Such extension shall be granted at no additional cost to the Government.

9. PERFORMANCE.

9.1. If the Contractor's work is found to be unsatisfactory and if it is determined that fault or negligence on the part of the Contractor or his employees has caused the unsatisfactory condition, the Contractor will be liable for all costs in connection with correcting the unsatisfactory work. The work may be performed by Government forces or Contractor forces at the direction of the Contracting Officer. In any event, the Contractor will be held responsible for all costs required for correction of the unsatisfactory work, including payments for services, automotive expenses, equipment rental, supervision and any other costs in connection therewith, where such unsatisfactory work as deemed by the Contracting Officer to be the result of carelessness, incompetent performance or negligence by the Contractor's employees. The Contractor will not be held liable for any work or type of work not covered by this contract.